REUSE OF SOFTWARE ASSETS FOR THE NASA EARTH SCIENCE DECADAL SURVEY MISSIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ESDS Reuse Working Group

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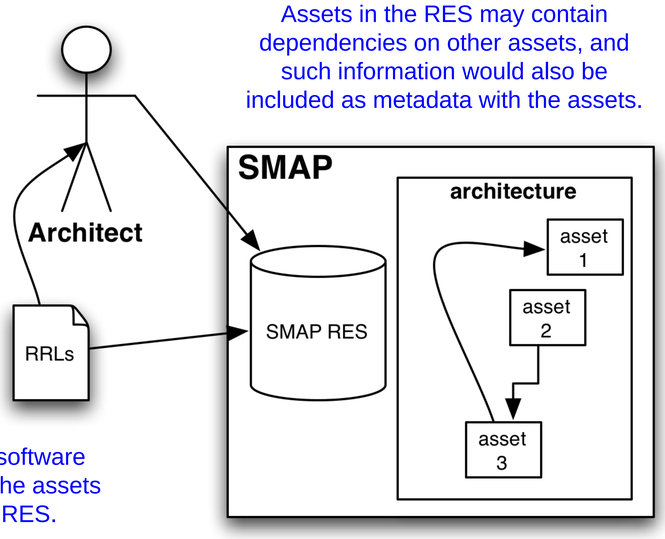
Abstract

Software assets from existing Earth science missions can be reused for the new decadal survey missions that are being planned by NASA in response to the 2007 Earth Science National Research Council (NRC) Study. The new missions will require the development of software to curate, process, and disseminate the data to science users of interest and to the broader NASA mission community. In this paper, we discuss new tools and a blossoming community that are being developed by the Earth Science Data System (ESDS) Software Reuse Working Group (SRWG) to improve capabilities for reusing NASA software assets.

Using the SRWG RRLs and RES to design and implement NASA decadal survey missions.

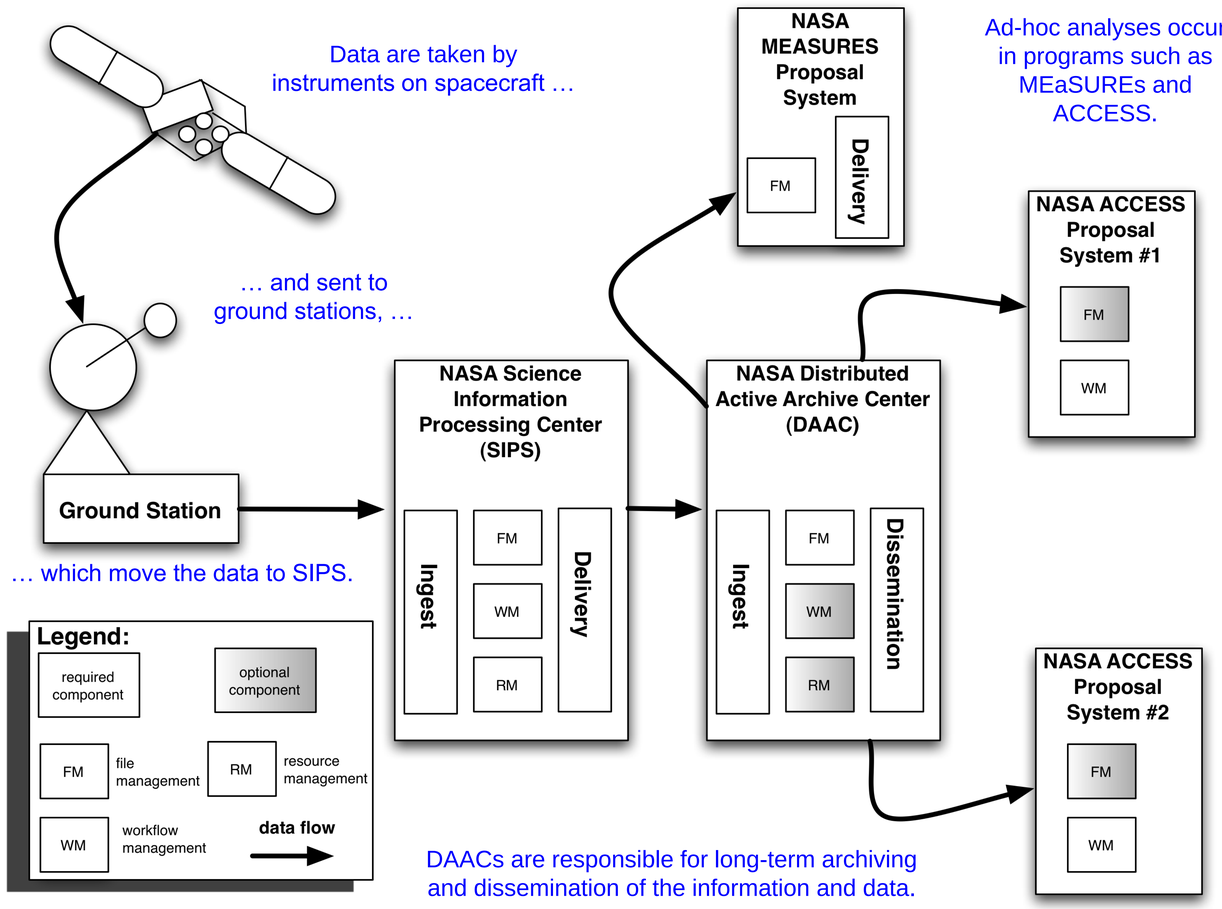
The system architect consults the Reuse Readiness Levels (RRLs) to determine the reuse maturity of assets to be stored in the mission's Reuse Enablement System (RES).

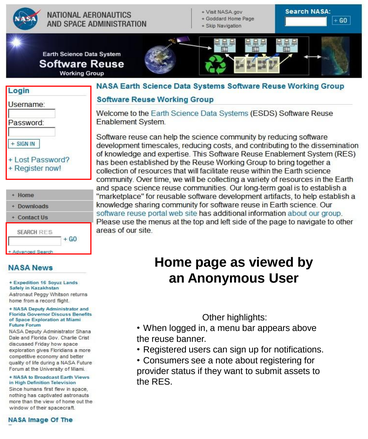


Assets in the RES may contain dependencies on other assets, and such information would also be included as metadata with the assets.

RRL assessments of software assets are stored with the assets as metadata in the RES.

The NASA Earth Science Context

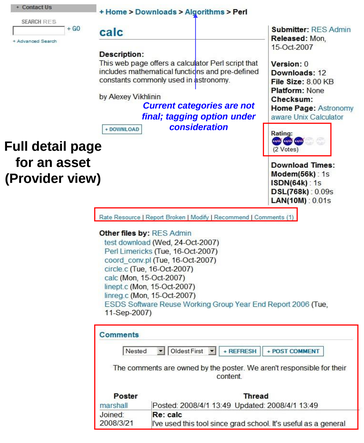




Home page as viewed by an Anonymous User

Other highlights:

- When logged in, a menu bar appears above the reuse banner.
- Registered users can sign up for notifications.
- Consumers see a note about registering for provider status if they want to submit assets to the RES.



Full detail page for an asset (Provider view)

Sample Reuse Tools

RES (first prototype)

The RES is designed to provide information about and easy access to reusable Earth science software assets in order to help developers achieve the benefits of reuse by encouraging systematic reuse.

RRL Summary Table

RRLs can be used to assess software under development or software being considered for adoption. The summaries here are based on nine topic areas and their levels, which can provide a more detailed assessment.

For more information, please visit:
http://www.esdswg.com/softwarereuse

Level	Reuse Readiness Level (RRL) Summary
RRL 1	Limited reusability; the software is not recommended for reuse.
RRL 2	Initial reusability; software reuse is not practical.
RRL 3	Basic reusability; the software might be reusable by skilled users at substantial effort, cost, and risk.
RRL 4	Reuse is possible; the software might be reused by most users with some effort, cost, and risk.
RRL 5	Reuse is practical; the software could be reused by most users with reasonable cost and risk.
RRL 6	Software is reusable; the software can be reused by most users although there may be some cost and risk.
RRL 7	Software is highly reusable; the software can be reused by most users with minimum cost and risk.
RRL 8	Demonstrated local reusability; the software has been reused by multiple users.
RRL 9	Demonstrated extensive reusability; the software is being reused by many classes of users over a wide range of systems.